

VORAS - KAIMAKCHALAN (GREECE)

PRESENTATION OF THE NATURAL CHARACTERISTICS AND THE PROTECTION STATUS

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ARCTUROS

A. General Information

Geography

Voras - Kaimakchalan is one of the highest mountains in the south Balkans, the third highest Greek mountain and is a natural border between Greece and the Former Yugoslavian Republic of Macedonia. Usually in Greece Voras is the name for the entire Mountain and Kaimakchalan for its peak. It has a south-west to north-east direction until the peak of mountain Tzena, its peak belong to the two countries and reach 2.521 meters above sea level.

The general anaglyph of Voras presents two extensions. The south-west lowland sides meet the south-east sides of mountain Vernon and separate the basins of Florina and Amyntaion. On the other side the south-east sides meet the north sides of mountain Vermion and separate the region of Arnissa from the rest of the prefecture of Pella.



The borderlines of the area in the framework of Natura 2000 network

Voras Mountain has been evaluated as special important area. For this, in the framework of the implementation of 92/43/EU Directive in Greece, it is included to the European Protected Areas Network "Natura 2000" with the description "Koryfes Orous Voras" (Voras Mountain Peaks) and the code GR1240001. The information of the present reference are related with this concrete area which has a total surface of about 40.000 hectares, minimum elevation 500, maximum 2.521 and an average of 1.600 meters above sea level. The area, except of the large extension (the average extension of a protected area in Greece is about 10.000 hectares), has large biodiversity which is one of the most characteristic feature.

General the area has evaluated and characterised as Bird Important Area and Biogenetic Reserve. The borderline of the area starts from the state forest of Pefkoto Almopias and follows south-west to Loutra and the direction Orma - Sarakini until the Kerasia settlement of the community of Karidia. It continues in west direction until the communities of Panagitsa, Zervi and the old settlement of Agios Athanasios. From this point follows north - north-east direction until Papadia and finally to the borders.

Coverage, Land use

The main land coverage of the mountain form is the forest with a percentage of 91%, including bush land, meadows, as well clear and rocky areas. Related with the property status, the larger percentage, about 80% is state property, while the rest 20% has a variety of property forms (private, belonging to communities or both to the state and owners).

B. Abiotic features

Climate

According to the Koeppen climate type, the climate of the region is characterised as Mediterranean Dfb, wet continental, with cold winters and an average annual temperature of the coldest month lower than 0°C. There is almost no dry period and the summer is short and warm with an average annual temperature of warmest month larger than 10°C.

There is a clear difference between the two sides of the borders related to the levels of both the temperature and the rainfall. This is due to the different sun exposition, to the exposition of the north side to the cold winds, but also to the neighboring of the south side with the Aegean Sea. On the tops the present of the snow is intense, with more 5 meters locally, while at north points remains for the longest time of the year.

Geology - Soil

The region belongs to two geotectonic zones of Almopia and Pelagonia. The zone of Almopia consists of rocks of three different units, Ano Garefi, Ano Peternik and Pozar Loutra (spa). Also there is a significant appearance of volcanic rocks of the Tertiary age. The categories of the soils of the region, according to the motherly soil material from which are originated, are mainly soils from humification of hard limestone transformed rocks, tertiary laying downs, flysch, basic pyric rocks, soils of acid pyric rocks and alluvial soils.

Hydrology - Hydrographic network

According to the hydrology at Voras, two large areas are distinguished:

- A. One north area, in which the hydrographic network is appearing with tree form, is dense with short branches and presents a symmetrical development. The effluence basins are well formed, large, almost pear shaped and concentrates the waters to the region of Almopia.
- B. One south area, the hydrographic network is appearing rarer and with unsymmetrical development. The hydrographic branches follow three different directions, one west forward to Erigonas River in the region of Florina and has northward direction in to the Former Yugoslavian Republic of Macedonia, one south forward to Vegoritida Lake at Ptolemaida's basin and one east forward to Almopia region. Characteristic feature of this area is the many springs, which supply the hydrographic networks in converse with the north area where there are fewer springs. The effluence basins are larger and vary from long shaped to almost circular.

C. Biotic features

Flora

From the total number of flora species of Voras region 157 taxa (species or subspecies) are included to the catalogue of the important species. From these 4 are local endemic (*Crepis arcuata*, *Ranunculus cacuminis*, *Viola doerfleri*, *Viola vollotisi*), 6 Greek endemic, 88 Balkan endemic from which 8 have quite small distribution, restricted absolutely to the North Greece and the south regions of the neighbouring countries and 59 are with more wide distribution. Four of the important taxa with wide distribution in Greece are presented only in the region of Voras, which is the southern point of their distribution. These species are *Carex lasiocarpa*, *Juncus trifidus* spp. *trifidus*, *Ligusticum mutelina* and *Pimpinella saxifraga*. Related with the form of the plants, the taxa listed as important are 145 herbs, 8 grasses, 2 bushes and 2 trees.

Totally, 59 taxa included in some protection status. From these, 40 are included in international conventions or/and to the Presidential Degree 67/1981 and only 19 are included to the Presidential Degree 67/1981. Among these which are including in some protection status, one is Local Endemic of Voras, one is Greek Endemic, 6 Short Distributed Balkans, 15 Balkans and 36 with Wide Distribution.

Vegetation

Related to the vegetation of the region, there are types of habitats, which are included at the Annex I of the Habitat Directive 92/43/EU. Additionally there are some other, which are not included at the Directive, but are important element for the creation of a completed view of the region. Totally the types of these biotopes and their Natura 2000 Code (NC) or Suggested Code (SC) are the follows:

1. *Juniperus communis* formations on calcareous heaths or grasslands. (NC: 5130). These are man made meadows with bushes, which are the result of the degradation of the surroundings beech forest communities.
2. Stepped and garland grassland (NC: 6173). These mountain pastures appear mainly above of the

forest limits on the region and are characterised by the presence of the *Juniperus nana*, *Vaccinium myrtillus*, *Bruckenthalia spiculifolia*, *Daphne oleoides*, *Thymus* sp. and *Nardus stricta*, species.

3. Sub-continental steppic grassland (NC: 6211). These habitats are dispersed openings into the forest with or not fern (*Pteridium apullinum*) which are the result of intense human intervention.
4. Species rich in *Nardus*, on siliceous substrates in mountain areas (and submountain areas, in continental Europe) (NC: 6230). They are alpine and subalpine meadows, which are present above the treelines and mainly above 1800 meters, on all the exposition slopes with middle and in places large inclinations.
5. Upland blanket bogs (NC: 7132), from which the bog of Kali Pediada is at 1700 meters above the sea level and maybe has the larger extension in Greek peninsula.
6. Alkaline fens (NC: 7230), in which springs with gush water are included and in which special ecological conditions have been created, appropriate for the development of substantial flora and vegetation units.
7. Vegetated silicolous inland cliffs with chasmophytic vegetation (NC: 8220). There are partial forest covered extensions with intense inclinations, steep slopes, as well as clear rocky and mainly silicon prominence in high elevations.
8. Caves not open to the public (NC: 8310).
9. Acidophilous beech forests (*Luzulo - Fagenion*) (NC: 9110).
10. Beech forests with *Ilex* and *taxus* rich in epiphytes (*Illici - Fagion*) (NC: 9120).
11. Neutrophilous *Asperulo - Fagetum* beech forests (*Asperulo - Fagenion*) (NC: 9130).
12. Wood melick beech forests *Melico - Fagetum* (SC: 913010).
13. Subalpine beech woods with *Acer* and *Rumex arifolius* (NC: 9140).
14. Calcareous beech forests (*Cephalanthero - Fagion*) (NC: 9150), which are characterized from the intense present of orchids as well as the species of the family *Poaceae* and the genus *Carex*.
15. Greek alder galleries with *Alnus glutinosa* (SC: 91K0).
16. *Quercus trojana* woods (Italy and Greece) (NC: 9250).
17. Chestnut woods (NC: 9260).
18. Hellenic beech forests with *Abies borisii-regis* (fir) (NC: 9270).
19. Thermophyle beech forests (*Quercion frainetto* p.) (NC: 9280).
20. Greek *Quercus dalechampii* woods (SC: 928012).
21. *Salix alba* and *Populus alba* galleries (NC: 92A0).
22. Oriental plane woods (*Platanion orientalis*) (NC: 92C0).
23. Oriental hornbean woods (*Carpinus orientalis*) (NC: 925010).
24. Greek Scots pine forests (*Pinus sylvestris*) (SC: 941012).
25. Pallas pine forests (*Pinus nigra* ssp. *pallasiana*) (NC: 9536).
26. Pallas pine forests with Scots pine (mixed forests) (SC: 9536a).
27. Macedonian pine woods (*Pinus peuce*) (NC: 9537).

Fauna

Fish-amphibians-reptiles

Voras mountain region is an important refuge for a lot of fauna species mainly birds and mammals. Two species of fish are present in the area, the trout (*Salmo macrostigma*) and "moustakatos" (*Barbus meridionalis*), 7 species of amphibians (from the total 17 species in Greece), while the representative species of reptiles is small, due to the high elevation and the wet climate. Only 5 species of reptiles have been registered 2 of which are tortoises.

Birds

Special for the avifauna, despite the general absence of elements for the region, the importance of Voras is great. There are 130 species included to the total catalog, and the presence of other is certain.

From these, 112 birds nest at the region, while the numbers of threaten and protected species is significant. Two of them are listed as worldwide threaten species, the imperial eagle (*Aquila heliaca*) and the lesser kestrel (*Falco naumanni*). 22 are included at the Red Data Book of Threaten Vertebrates of Greece. 33 are included at the Annex I of the 79/409 Directive and 105 at the Annex II of the Bern Convention. 49 are included in a special category of European species according the edition of BirdLife International "Birds in Europe: their conservation status". Finally, there are 114 species, which meet one of the above criteria (see the table below).

Voras has specific importance for birds of prey, while 23 species have been observed, from which 13 nest into the region, as well as for 9 species of woodpeckers. Also, species with restricted distribution in Greece or in Europe are represented. Examples for the first case are the imperial eagle, which mentioned before, the bearded vulture (*Gypaetus barbatus*), the montagu's harrier (*Circus pygagrus*), the hazel hen (*Bonasa bonasia*), the fieldfare (*Turdus pilaris*) and the snow finch (*Montifringilla nivalis*). The levant sparrowhawk (*Accipiter brevipes*), the long legged buzzard (*Buteo rufinus*), the lesser-spotted eagle (*Aquila pomarina*) and the semi collared flycatcher (*Ficedula semitorquata*) are European examples.

Number of avifauna species which present and breeding in Voras and their protection status.

Protection Status	Presented Species	Breeding Species
World Wide Threaten	2	1?
Red Data Book	22	12
Annex I of Directive 79/409	33	24
Annex II of Bern Convention	105	89
Species of European Conservation Concern	49	38
Species with one of above criteria	114	98
Total species number	130	112

Mammals

Many species of mammals are present in Voras. Except of the species that are general common at the Greek mountain masses, such as the hare, the fox, the badger, the wild boar, the beech marten etc, special interest is presented for the existing of the bear, the lynx (?) and the chamois at the region of Promahoi. The catalog with the main mammals of the area includes:

- From Carnivores, the bear (*Ursus arctos*), the wolf (*Canis lupus*), the lynx (?) (*Lynx lynx*), the badger (*Meles meles*), the fox (*Vulpes vulpes*), the wild cat (*Felis sylvestris*), the beech marten (*Martes foina*), the Weasel (*Mustela nivalis*) and the otter (*Lutra lutra*).
- From Artiodactyla, the roe deer (*Capreolus capreolus*), the wild boar (*Sus scrofa*) and the chamois (*Rupicapra rupicapra*).
- From Insectivora, the hedgehogs (*Erinaceus europeus*), the blind (*Talpa caeca*) and northern mole (*Talpa europea*).
- From Lagomorpha the hare (*Lepus capensis*).
- From Chiroptera, the common pipistrelle (*Pipistrellus pipistrellus*) and the savi's pipistrelle (*Pipistrellus savii*) and
- From the rodents the red squirrel (*Sciurus vulgaris*).

Regarding large carnivores in particular, the following could be mentioned:

Bear: Before many years the presence of the bear was referred as problematic or not existent, but the last decade has permanent presence. During the last years, the presence is permanent at the side of Florina and especially at the region of Skopos, in which damages on beehives have been recorded, as well as the presence of male and female with cubs during 1998-1999. Unfortunately an adult male was killed in the region of Papadia in September 2000. At the east part of Voras, there is a permanent presence at the region of the settlements of Loutraki, Orma and Sarakini, while the summer of 2000 a female with cubs was observed for first time near Panagitsa and became permanent. Also significant importance has the finding of bear footprints, naturally originated from Voras, at a north part of Vermion mountain during the same year.



Wolf: According the results of the research for the distribution, the estimation of the population and the trends of the population of the wolf in Greece, in the framework of LYCOS - LIFE project, the presence of the wolf in Voras region is referred as permanent especially easterly. Actually, there are no distinctive periods with significant diversification during the last years or decades. Especially the wider area of Aridaia, (which is surrounded by the mountains of Voras, Pinovo and Paiko), presents the largest densities of wolf packs in Greece. Moreover it is not accidental that the prefecture of Pella is the first among the other prefectures in Greece related with the wolf damages on livestock. There is estimation that during 1998 there were 3-4 wolf packs, with an average size of 7 members, in the basin of Aridaia and Voras, within the region of Florina and up to Skopos.

Lynx: Until recently, the presence of lynx in Greece was in doubt and was included to the catalogue of the extinct Greek species. But recently, according with Mrs Panagiotopoulou (2001) there are references for lynx presence in two areas in Greece. One of these areas is Voras with two visual observations by a stock-farmer and woodcutters. The second reference is for the Nestos river delta. It is important to point references of people of Florina about cases of visual contact with mammals which are not wild cats or wolves, both at Voras and Varnountas (Peristeri). Therefore, at least with interrogative mark, lynx has to be included into the catalogue of Voras fauna.

D. Human activities

The human presence on the region of Kaimakchalan through the time is documented by several archaeological and historical elements as:

- A sculptured marble on a tomb with the representation of Hercules and Hermes since the end of 2nd AD century,
- One marmoreal pediment tomb column since the late roman age at the side of Florina,
- The important rock paintings in caves of Almopia, as well as
- A number of churches since Byzantine period until 17th and 19th century, both of east and west side of the mountain.

Today the east side of the mountain is densely populated with about 11.000 people, while on the west side live about 200 inhabitants in community of Skopos. The human activities are related mainly to the agriculture, the stock raising and the derivation of forest products, while one small percentage with the manufacturing, the trade and the service catering. Additionally, the function of Voras Ski Centre at the alpine zone, which is the larger ski resort in Greece, presents significant interest. Also, the Therapeutic Baths of Loutraki attracts a considerable number of visitors during the summertime.

The excavate activities in the region are related with the strip-mines for marble and inert materials near to the communities of Panagitsa and Orma on the east side, while at the west foot of the mountain at prefecture of Florina there are coal mines near to the community of Achlada. These mines are going to be extended in the framework of the function of the new factory for the production of electric power, which is constructed at the municipality of Meliti. For the necessary supply of water, the construction of a dam in the area of Papadia, a little bit lower of the borderline of Natura 2000 region, is already planned.

Also, one more human but not professional activity in the area, is hunting, especially intense with negative results in worrying levels both for legal game animals like wild boar and protected animals like roe deer. Also there was a case of a adult male bear killed at September of 2000 at the side of Skopos. Furthermore the cases of poachers arrested by military patrols for crossing the borderlines, is often.

E. Protection and management of the area

The 90,1% of the total extension of the area, are forests or forests lands. The Forestry Service of the Ministry of Agriculture is the authority for the protection and management and specifically the Forestry Services of Aridaia, Edessa and Florina. The framework of legal protection and sustainable management of Voras as "protected area" in Greece is determined by:

- the Greek legal status for the protection of the species and their habitats,
- the texts of the international law for the protection of wildlife what have authenticated and
- the wider framework of the European policy for the protection of the nature and the sustainable use of the natural sources, as it is implemented through the relevant directives and decisions of the Community and their application.

F. Working out of Special Management Plan for the Greek section of Voras

In the framework of the implementation of the above legal framework and mainly of the 92/43/EU Directive in Greece, a project for "Registration, recognition, evaluation and mapmaking of the habitat types and the species of fauna and flora in Greece", was started. Greek Biotope and Wetland Centre (EKBY) was the implementation authority. With the completion of the project, a national catalogue of 296 areas especially important for including to the European Network of protected areas "Natura 2000". Voras Mountain is included in this catalogue.

Greek Biotope and Wetland Centre (EKBY) implemented a Special Management Plan in the framework of the project "Conservation and management areas of Community interest (Directive 92/43/EU)" for Voras Mountain. The results are related with the formation of proposals for concrete measures and necessary actions related with the aim of securing the conservation of natural habitats and the most important species of flora and wild fauna at the region "peaks of Voras Mountain".

The specific proposals that are designed to this action plan focus on the following axons:

- Promotion of the legal framework for the conservation of habitat types and fauna and flora species, as well as for a sustainable development in local level.
- Production, fruit and utilisation of knowledge and experience on aspect related with the habitat types, fauna and flora species as well as their conservation in local level.
- Promotion of measures for conservation and restoration of habitat types, fauna and flora species.
- Promotion of the awareness and the information of local authorities and people on aspects related with the natural, economical and social values of the area and their essential participation on conservation issues.

- Formation of the appropriate conditions for the implementation of economical activities according to the order of the sustainable development.

Finally, it is important to be referred that the Special Management Plan for the area "Peaks of Voras Mountain" was the main source for the present text.

References

- Dafis, S., E. Papastergiadou, K. Georgiou, D. Babalonas, Th. Georgiadis, M. Papageorgiou, Th. Lazaridou and B. Tsiaousi.** 1997. Directive 92/43/EU. The Habitat Task in Greece: Nature 2000 Network. Contract number B4-3200/84/756 DG/XI. European Communities Commission, Goulandri Natural History Museum - Greek Biotope and Wetland Center (EKBY). 932 pp (in Greek).
- Iliopoulos, G.** 1999. Distribution, estimation of the population and the trends of wolf population (*Canis lupus*) in Greece. LYKOS project for wolf conservation in Greece. Thessaloniki. ARCTUROS, General Secretariat of Forests and Natural Environment of Ministry of Agriculture, LIFE (DG/XI EC) (in Greek).
- Mantzavelas, A.** (Edition Co-ordinator) 1996. Special Management Plan of the area "Peaks of Voras Mountain". Greek Biotope and Wetland Center (EKBY) (in Greek).
- Panagiotopoulou, M.** 2001. Historical distribution and present status of the lynx in Greece. In: The Balkan Lynx Population - History, Recent Knowledge on its Status and Conservation Needs. Kora Bericht Nr 7:28-31.
- Sophianidou, S. Th.** 1996. Systematic of Tetrapodes. With annex of Greek species. Giahoudi - Giapouli Editions. Thessaloniki. (in Greek).
- Tsougrakis, G.** 1996. Special Management Study MOUNTAIN VORAS Avifauna. Greek Biotope and Wetland Center (EKBY) (in Greek).

The beech is a common tree in Voras, but the mixed plant societies with it form a variety of important types of the Directive 92/43/EU habitats. / Lazaros Georgiadis